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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/495,708	02/01/2000	Yutaka Kai	1460.1002	5201

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EXAMINER	
BELLO, AGUSTIN	
ART UNIT	**PAPER NUMBER**
2633	

DATE MAILED: 01/11/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/495,708	KAI ET AL.	
	Examiner	Art Unit	
	Agustin Bello	2633	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *12 October 2005*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-60* is/are pending in the application.

4a) Of the above claim(s) *13 and 35* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,2,4,7-10,14-24,26,29-32 and 36-60* is/are rejected.

7)☒ Claim(s) *3,5,6,11,12,25,27,28,33 and 34* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Election/Restrictions

1. Applicant's election without traverse of Group I including claims 1-12, 14-34, and 36-60 is hereby acknowledged.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. Claims 1, 2, 4, 7, 8, 10, 23, 24, 26, 29, 30, 32, 45-48, 53, and 58-60 are rejected under 35 U.S.C. 103(a) as being unpatentable over Puschell (U.S. Patent No. 5,444,528).

Regarding claims 1, 23, and 45-47, Puschell teaches a selected-wavelength tuning apparatus, comprising: an acoustic optical tunable filter (reference numeral 12 in Figure 1) for branching light into selected-wavelength light and light with other wavelengths in accordance with the radio-frequency signal; a radio-frequency signal generating means (reference numeral 38 in Figure 1) for generating said radio-frequency signal; a light intensity detecting means (reference numeral 26-29, 31-33, 36-37 in Figure 1) for detecting light from said acoustic optical tunable filter; and a radio-frequency signal controlling means (reference numerals 36-38 in Figure 1) for controlling said radio-frequency signal generating means so as to select light of a predetermined wavelength in accordance with an output of said light detecting means (column 6 lines 23-36). Puschell differs from the claimed invention in that Puschell fails to specifically teach rotating polarization in accordance with a radio-frequency signal in the acousto-optic

tunable filter. However, it is obvious but not inherent that the AOTF of Puschell functions by rotation the polarization in accordance with a radio-frequency signal. For example, Puschell teaches that in an AOTF an input light signal is polarized by a polarization beam splitter, then a wavelength of the signal is rotated by the surface acoustic wave in that the light signal and the surface acoustic wave interfere with one another and only the light signal of part of the wavelength is polarized selectively by surface acoustic wave created by the input of a radio frequency signal. Next, the light signal of the wavelength polarized is polarized and separated by a second polarization beam splitter which allows selection of particular wavelengths. Clearly, the AOTF of Puschell operates according to the same principle of polarization rotation according to an input radio frequency as that claimed by the applicant. Therefore, it would have been obvious but not inherent to one skilled in the art at the time the invention was made that the AOTF of Puschell operates according to the same principle of polarization rotation according to an input radio frequency.

Regarding claims 2, 10, 24, and 32, Puschell teaches a radio-frequency signal controlling means (reference numerals 36-38 in Figure 1) comprising a maximum value discriminating means (reference numeral 36-37 in Figure 1) for discriminating a maximum value of said light intensity with respect to an optical signal of a predetermined wavelength by receiving said light intensity from said light intensity detecting means while changing the frequency of said radio-frequency signal generated by said radio-frequency signal generating means; and a frequency controlling means (reference numeral 37-38 in Figure 1) for controlling said radio-frequency signal generating means so as to generate the radio-frequency with the frequency which makes a light intensity discriminated by said value discriminating means.

Regarding claims 4 and 26, it is clear from the discussion regarding claim 2, that the system of Puschell has the ability to maximize the intensity of the light output from the AOTF. One skilled in the art would clearly have recognized that since the AOTF selects a wavelength to output based on the radio frequency signal input to the AOTF, and the intensity of the output wavelength is governed by the intensity of the radio frequency signal input to the AOTF, the AOTF of Puschell would have been capable of maximized the light intensity of the output wavelength every time the optical signal of specific wavelength is changed based on the feedback from the spectrum monitor.

Regarding claims 7 and 29, Puschell teaches the selected-wavelength tuning apparatus according to claim 1, wherein said light intensity detecting means is an optical spectrum analyzer (reference numeral 26-29, 31-33, 36-37 in Figure 1) for further detecting said light wavelength and said radio-frequency signal controlling means (reference numerals 36-38 in Figure 1) generates the radio-frequency signal with a known frequency (inherent) and computes the relationship between the selected-wavelength of said AOTF and the radio-frequency based on the output of said optical spectrum analyzer.

Regarding claims 8 and 30, Puschell differs from the claimed invention in that Puschell fails to specifically teach an optical amplifier connected to the optical input side of said AOTF. However, the use of optical amplifiers in the field of optical communication is well known in the art and the examiner gives Official Notice that as much is true. One skilled in the art would have been motivated to employ an optical amplifier in the device of Puschell in order to increase the optical signal level prior to being input to the AOTF. Therefore, it would have been obvious to

one skilled in the art at the time the invention was made to include an optical amplifier in the device of Puschell.

Regarding claims 48, 53, and 58-60, Puschell teaches that the controlling unit controls the radio-frequency signal generating unit so as that the selected at least one wavelength is selected in accordance with an output of said light intensity detecting unit to thereby compensate for shifts in the selected wavelengths due to temperature changes (e.g. "temperature controlled" AOTF throughout Puschell).

4. Claims 9 and 31 are rejected under 35 U.S.C. 103(a) as being unpatentable over Puschell in view of Aronson (U.S. Patent No. 5,452,314).

Regarding claims 9 and 31, Puschell differs from the claimed invention in that Puschell fails to specifically teach a plurality of said acoustic optical tunable filters are formed on the same single substrate and temperature controlling means for controlling temperature of the plurality of said acoustic optical tunable filters to be the same. However, Aronson, in the same field of endeavor, teaches it is well known in the art to form a plurality of tunable filters on a single substrate (column 5 lines 3-9) and to include a temperature controlling means (column 5 lines 36-41) for controlling temperature of the plurality of said acoustic optical tunable filters. One skilled in the art would have been motivated to have formed a plurality of tunable filters on a single substrate and to have included a temperature controlling means for controlling temperature of the plurality of said acoustic optical tunable filters in order to reduce the overall size of the system and to maintain the operation of the filters at a nominal temperature, respectively. Therefore, it would have been obvious to one skilled in the art at the time the invention was made to have formed a plurality of tunable filters on a single substrate and to have

included a temperature controlling means for controlling temperature of the plurality of said acoustic optical tunable filters.

5. Claims 14-19, 36-41, 49-50, and 54-55 are rejected under 35 U.S.C. 103(a) as being unpatentable over Puschell in view of Chueng (U.S. Patent No. 5,002,349).

Regarding claims 14, 17, 18, 36, 39, and 40, Puschell teaches radio-frequency signal generating means (reference numeral 37-38 in Figure 1) for generating said radio-frequency signal; light intensity detecting means (reference numeral 26-29, 31-33, 36-37 in Figure 1) for detecting the intensity of light from said AOTF; and radio-frequency signal control means (reference numerals 36-38 in Figure 1) for controlling said radio-frequency generating means so as to select light of a predetermined wavelength in accordance with the output of said light intensity detecting means. Puschell differs from the claimed invention in that Puschell fails to specifically teach the inner working of the AOTF as claimed. However, such AOTF are well known in the art. Cheung, for example, teaches an AOTF which comprises first polarizing means (reference numeral 108 in Figure 6) for branching an optical input into TM and TE mode lights, first radio-frequency signal applying means (reference numeral 16 in Figure 6) for applying first radio-frequency signal to a first optical waveguide which is for propagating the TM mode light branched by said first polarizing means, second radio-frequency signal applying means (reference numeral 16 in Figure 6) for applying second radio-frequency signal to a second optical waveguide for propagating the TE mode light branched by said first polarizing means, and second polarizing means (reference numeral 110 in Figure 6) for multiplexing optical signals from said first optical waveguides to which said first radio-frequency signal has been applied and said second optical waveguides to which said second radio-frequency signal has been applied,

and branching them as first and second outputs corresponding to the state of polarization of the light. Clearly, the AOTF of Puschell functions in a manner similar to that of Cheung and therefore, it would have been obvious to one skilled in the art at the time the invention was made to include an AOTF with inner working such as those taught by Cheung in the device of Puschell.

Regarding claims 15 and 37, the combination of Puschell and Cheung teaches the selected-wavelength tuning apparatus according to claim 14, wherein said radio-frequency signal applying means are two radio-frequency signal applying means (as seen in Figure 1), of which the first radio-frequency signal applying means applies the radio frequency signal to the TM mode light branched by said first polarizing means and the second radio-frequency signal applying means applies the radio-frequency signal to the TE mode light branched by said first polarizing means and said radio-frequency signal generating means supplies the radio-frequency signals of different frequencies to said first and second radio-frequency signal applying means.

Regarding claims 16 and 38, the combination of Puschell and Cheung teaches that the AOTF filters used in the system can be cascaded (as seen in Figure 2 of Cheung), thereby inherently teaching a third polarization means for branching the lights exited from a first AOTF into TM and TE modes. Puschell also teaches the claimed invention first and second intensity detection means (as seen in Figure 1).

Regarding claims 19 and 41, the combination of Puschell and Cheung teaches the optical add/drop multiplexer according to claim 18 and 40, in which a plurality of acoustic optical tunable filters are connected in tandem (see Figure 2 of Cheung).

Regarding claims 49-50 and 54-55, Puschell teaches that the controlling unit controls the radio-frequency signal generating unit so as that the selected at least one wavelength is selected in accordance with an output of said light intensity detecting unit to thereby compensate for shifts in the selected wavelengths due to temperature changes (e.g. "temperature controlled" AOTF throughout Puschell).

6. Claims 20-22, 42-44, 51-52, and 56-57 are rejected under 35 U.S.C. 103(a) as being unpatentable over Puschell in view of Robinson (U.S. Patent No. 5,452,314).

Regarding claims 20, 22, 42, and 44, Puschell teaches an AOTF (reference numeral 12 in Figure 1) for rotating polarization in accordance with a radio-frequency signal and for branching light into selected-wavelength light and light with other wavelengths in accordance with the radio-frequency signal; light intensity detecting means (reference numeral 26-29, 31-33, 36-37 in Figure 1) for detecting the intensity of the light from said AOTF; radio-frequency signal controlling means (reference numerals 36-38 in Figure 1) for controlling said radio-frequency signal generating means so as to select light of a predetermined wavelength in accordance with the output of said light intensity detecting means. Puschell differs from the claimed invention in that Puschell fails to specifically teach a storage means for storing the frequencies of said radio-frequency signal that changes and light intensity detected by said light intensity detecting means with respect to the frequency. However, the use or a storage means in optical communication system and AOTF systems is very well known in the art. Robinson, in the same field of endeavor, teaches a system wherein AOTF are used to filter selected wavelengths and storage means (column 23 line 62- column 24 line 30) is used to store the frequencies of said radio-frequency signal that changes and the intensity information detected by the intensity detection

means of the system. One skilled in the art would have been motivated to have used a storage means to store the frequencies of said radio-frequency signal that changes and intensity of the selected wavelengths in order to track the effects of certain frequencies on certain intensities. Therefore, it would have been obvious to one skilled in the art at the time the invention was made to have included a storage means in the device of Puschell as taught by Robinson.

Regarding claims 21 and 43, Puschell teaches a rejecting means for rejecting the light exited from said AOTF (reference numeral 42 in Figure 1).

Regarding claims 51-52 and 56-57, Puschell teaches that the controlling unit controls the radio-frequency signal generating unit so as that the selected at least one wavelength is selected in accordance with an output of said light intensity detecting unit to thereby compensate for shifts in the selected wavelengths due to temperature changes (e.g. "temperature controlled" AOTF throughout Puschell).

Allowable Subject Matter

7. Claims 3, 5-6, 11, 12, 25, 27-28, 33, and 34 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

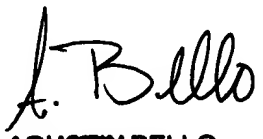
Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Agustin Bello whose telephone number is (571) 272-3026. The examiner can normally be reached on M-F 8:30-6:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jason Chan can be reached on (571)272-3022. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

AB



AGUSTIN BELLO
PRIMARY EXAMINER